Modern Engineering

March 15 | Day 15

Prudential Financial

GENERAL ASSEMBLY

LESSON ROADMAP

AWS Cloud Formation

Load Balancing

AWS DynamoDB

AWS Deployment

Prudential AWS

MEF MODULE 5 DAY 15: AWS Cloud Formation

Schedule	
9:00–10:00 am	Welcome and Warm-Up / Lab Time
10:00 am–12:00 pm	**GUEST: Cloud Formation Template**
12:00 am–12:30 pm	**GUEST: How Prudential Uses AWS Resources**
12:30–1:30 pm	Lunch
1:30-2:00 pm	**AWS Cloud Formation Provisioning**
2:00–4:50 pm	**AWS DynamoDB**
4:50–5:00 pm	Bring It Home

LEARNING OBJECTIVES

1. Understand AWS Cloud Formation architecture
2. Articulate the benefits of logging in a cloud-based application
3. Use AWS DynamoDB to replace a Postgres SQL database in an Express application
4. Explore Prudential's Cloud Formation templates and use of AWS services

GUEST SPEAKER:
Prudential's Cloud Formation Template

GUEST SPEAKER:
How Prudential Uses AWS Resources

Break Time

Automation and CloudFormation

Intro to AWS CloudFormation

Intro to CloudFormation

AWS CloudFormation is an IaC tool for managing resources on AWS.

It integrates well with most AWS services and provides a set of pre-defined resource types that can be configured.

CloudFormation works by allowing you to define **templates.** These templates can be written in YAML or JSON and are declarative: they describe the resources you want to manage and use.

Example CloudFormation Template

```
Resources:

  MyS3Bucket:

    Type: 'AWS::S3::Bucket'

    Properties:

      BucketName: my-bucket-name
```

Above is a simple example template for creating an **S3 bucket in YAML**.

Guided Walk-Through: CloudFormation

30 minutes

Now, let's go through a guided Intro to CloudFormation GUI on AWS, and CloudFormation CLI.

If you haven't done so already, make sure you are logged into your AWS account: https://console.aws.amazon.com

Common Use Cases

We'll be using CloudFormation to handle some common use cases:

- Provisioning resources, such as VMs
- Managing security groups
- SSH Keys
- EIP

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Deploying to AWS

The limitations imposed by ephemeral environments

- No server to log into and inspect
- All configuration must be scripted
- All apps must be able to start in an automated way
- Nominally more complex networking, endpoints, and AWS infrastructure

The limitations imposed by asynchronous systems and microservices

- The requests and logs may not match up in a linear fashion
- Higher than expected latency
- A multitude of deployments
- Nominally more complex networking, endpoints, and AWS infrastructure

Security Groups

Firewalls on Steroids

- Ports and traffic can be allowed by:
  - IP
  - CIDR
  - Other security groups - this is the killer feature

IAM Roles

RBAC and ABAC

- IAM roles cover human users, services, and applications.
- Every service, instance, and operation has an IAM role.

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Criticality of GOOD Logging

Guided Walk-Through:

Provisioning Resources

Using CloudFormation:

- Provision an EC2 instance
- Add a security group
- Add an SSH key
- Add an EIP

We will be available to provide additional support and troubleshoot problems.

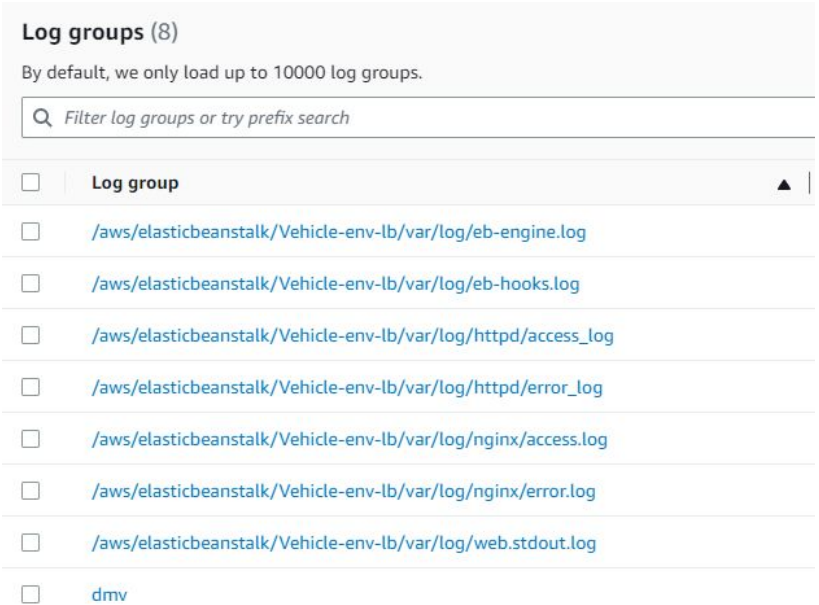
Detailed instructions can be found in GitHub.

“

Good logs in a word: DETAIL. You need to know not only what service failed but have enough information to trace the path through other services.

CloudWatch

- Ephemeral applications **require** centralized, external logging.
- CloudWatch logs have configurable retention.
- They are searchable.
- They span instances.



AWS Cloud Formation

AWS DynamoDB

AWS DynamoDB: A More Flexible Database

SQL's greatest strength can sometimes be its greatest weakness as well: the strictly controlled **structure** requires tight management of schemas and changes over time.

DynamoDB is the AWS solution to providing a NoSQL database solution: less structure, less tight relationships among schemas, just a fast and simple form of data storage.

Guided Walk-Through:
DynamoDB Demo

Exploring a Cloud-Based NoSQL Database: A Walkthrough Using DynamoDB.

Solo Exercise:

Daily Exit Ticket

3 minutes

- Please take a moment to give us your feedback after today's course!
- Use the QR code or follow the link: https://bit.ly/pruMEF-c3

Scan Me!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